Stanley in middle explains to W. Gould Brokaw and R. V. Hartford all about his fast steamer

on the other hand, the increased complication which such a device would entail, the difficulty in making it operative at all times, and the slight increase in efficiency which would probably result from its use would make its practical utility somewhat doubtful. In large motors of, say 100 H. P. and over, the saving might be sufficient to warrant the use of some such device; but for the more common sizes of lesser power it would seem that refinement and development would have to proceed along other lines, and that for some time to come the rough governing of the circulation in direct ratio to the speed of the motor would have to be "good enough."

Some Observations on Acetylene

Acetylene gas is generated by the chemical decomposition of water and calcium carbide. It is a permanent gas and of greater density than the ordinary coal gas, though less in volume per unit of weight. It will pass through a smaller aperture than ordinary coal gas. Notwithstanding the fact that this is a high power illuminant, no case of asphyxiation from it has so far been reported.

The composition of calcium carbide, which forms the principal ingredient of this gas, is formed from a mixture of about 60 per cent. of lime and 40 per cent. of powdered coke. This mixture is subjected to intense heat, by which the carbon of the coke is enabled to chemically unite with the lime. When the mass cools it is crushed to commercial sizes, and is carried in iron drums that are air and water tight. The calcium carbide has an intense affinity for water and must be kept from contact with even the moisture of ordinary air. The chemical transformation which takes place when water is added to the carbide may be represented as follows: $Ca\,C_2 + H_2O = C_2\,H_2 + Ca\,O$, when expressed in words the formula reads, Calcium carbide plus water gives acetylene gas and slaked lime. Any excess of water simply makes a solution of lime, which may be used for the making of mortar or the lime-washing of walls and buildings.

The problem of storage of this gas has been very successfully met by the Commercial Acetylene Company, of New York, in what they call their dissolved system. A storage cylinder made of the highest quality of sheet steel is used, which is guaranteed to stand a pressure of 1,200 pounds per square inch. This cylinder is fully filled with perfectly fitting disks of asbestos, which have a porosity of about 80 per cent. By means of suitable apparatus this cylinder is filled with acetone, equal to 43 per cent. of the volume of the storage tank.

Acetone is a liquid produced by the destructive distillation of woody fiber and is similar to wood alcohol. When in the storage cylinder it completely saturates the asbestos. One of the properties of this liquid is its ability to dissolve acetylene at ordinary temperatures. Acetone dissolves 23 volumes of acetylene at 62° F. The storage cylinder is charged with acetylene up to 150 pounds pressure.

Acetylene stored in a porous substance like asbestos and held in solution by acetone cannot explode while in the cylinder. Tests made with a cylinder so charged showed that when heated to a dull red the contents carbonized, but no explosion took place.

A railroad car equipped with this form of light and used in suburban service will last about three months without recharging. Gas from the tank can be drawn off as required, the amount varying slightly with the temperature of the surrounding atmosphere. A regulating valve interposed between the storage tank and the car lamps feeds the illuminant constantly at low pressure to the burners. There is a safety relief device also provided so that in any remote chance the pressure in the low pressure piping should rise as high as five pounds per square inch the relief apparatus would operate and vent the gas outside the car.

For automobiles, acetylene makes a perfect light.

R. E. OLDS AND PARTY IN REO JAUNTING CAR ATTACHED TO TOURING CAR

Chrome Nickel Steel

In a recent address Col. Albert A. Pope said: "To-day there is nothing in automobile construction of more importance than the selection of materials. There are parts of a car where it is necessary to use a grade of metal that has great strength and is of such a composition as to resist heavy deflecting strains and yet be of so mild a character as to go through the shocks of daily use without crystallization and consequent breakage.

"The wonderful chrome nickel steel used with a small percentage of carbon can stand 140,000 pounds of tensile strength to the square inch and yet possess a very high elastic limit. These qualities make it especially suitable for pivot axles, steering knuckles and similar parts.

"Other treatments of this same material produce in it just the right qualities for use where great deflection, torsion and tensile strains must be resisted. We are using large quantities of chrome